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# PATENT SPECIFICATION

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## (54) A METHOD OF AND DISPENSER FOR CRIMPING PARTICULATE MATERIAL ONTO FINER GAUGE LINE

(71) I, DEREK FRANCIS BIRMINGHAM, a British citizen, of Park Cottage, 3 Woodcote Avenue, Wallington, Surrey, do hereby declare the invention for which I pray that a patent may be granted to me and the method by which it is to be performed to be particularly described in and by the following statement:-

This invention relates to a method of and dispenser for crimping particulate material onto finer gauge line or wire. The invention was developed specifically for attaching lead shot to fishing line, but it is envisaged that the generality in application of the invention may be such that it may find wider utility.

In angling every sportsman knows that especially in competition where time is at a premium, manually attaching split shot to the fishing line is irksome and loses valuable time. However skilful the angler, there is always the possibility of dropping, and losing, lead shot before it is attached to the line. Even when the lead shot is successfully attached, it is often not without difficulty since the line is quite fine in gauge relative to the human hand and, depending on eyesight, it can be difficult to insert the line into the split of the lead shot. Then the lead shot is required to be crimped round the line such that when released, the lead shot is firmly attached to the fishing line. Some anglers resort to using their teeth whilst others use pliers or other conventional pivotal crimping means, neither of which is adapted to seat the lead shot satisfactorily prior to the crimping action and from each of which the lead shot may be dislodged inadvertently prior to the crimping action.

Accordingly the present invention provides a method of crimping particulate material having a line receiving split or recess onto finer gauge line or wire, comprising inserting the finer gauge line or wire into an aperture means in a dispenser containing a plurality of pre-located split

particulate material elements one of which is pre-aligned with said aperture means, and expressing said one particulate material element through an outlet of said dispenser so dimensioned as to cause said split particulate material element to close around and become attached to said line.

The terminology "split particulate material elements" is used herein as a generic term which includes split lead shot but also is intended to have wider application to other elements adapted to receive a finer gauge line or wire and formed of a material which is sufficiently malleable to be crimped or compressed around the line. Also, the terminology "a finer gauge line or wire" is used herein as a generic term which includes fishing line but is intended to have wider application to other lines, wires, cables etc, about which the particulate material element is to be arranged and crimped.

In the specific application of the invention to angling there is provided a method of crimping split lead shot having a split therein onto a fishing line, comprising inserting the fishing line into aperture means in a dispenser for dispensing a plurality of pre-spaced split lead shot, one of which is aligned with said aperture means, and expressing said one lead shot through an outlet of said dispenser so dimensioned as to cause lead shot to close around and become attached to said fishing line.

The invention further provides a dispenser for crimping particulate material having a line or wire receiving split or recess onto finer gauge line or wire comprising a body having at least one compartment defining a seating for a single element of particulate material of a size related to said seating, the compartment having an entrance for said line or wire to be brought therein and received in the split or recess of said element whilst the element is retained on the seating and above an outlet and within said com-

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partment, said outlet being dimensioned to exert a crimping action on a particulate element expressed therethrough. Preferably the dispenser is provided with means for  
 5 expressing the particulate material element through said outlet.

It is envisaged that in the particular application of the invention to the field of angling, the outlet in the dispenser and the associated seating will be intended for a specific size of split lead shot. In some  
 10 embodiments the dispenser will be designed for retail sale with the lead shot individually encapsulated in respective ones of a series of compartments. In another embodiment the  
 15 lead shot is fed successively into the dispensing compartment of the dispenser, for example the lead shot may be in strip form and an individual lead shot weight severed from the  
 20 strip as it is expressed, the strip then being advanced to bring a succeeding item of lead shot into the dispensing compartment.

As will become apparent from the preferred embodiments, the means for expressing the particulate material element may be a  
 25 separate tool, or the compartment may be adapted by the provision of a manually displaceable wall portion, or a hammer member may be incorporated in the dispenser to directly express the element or dis-  
 30 place a displaceable wall portion of the compartment which, in turn, directly expresses the element.

Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in  
 35 which:-

Figures 1A, 1B, and 1C show fragmentary views of a first embodiment of an angler's dispenser for dispensing lead shot onto an  
 40 angling line;

Figures 2A, 2B, and 2C show an exploded view of parts of a second embodiment of angler's dispenser;

Figures 3A and 3B, 3C show respectively two forms in which the lead shot may be  
 45 incorporated for use in a dispenser;

Figure 4 shows a dispenser similar to that of Figure 1A with the addition of a rotatably  
 50 locatable hammer;

Figure 5 shows an alternative hammer arrangement to that of the embodiment of Figure 4; and,

Figure 6 shows the embodiment of Figure 5 modified to incorporate the dispenser of  
 55 Figure 1B.

Like reference numerals will be employed herein to designate like parts throughout the drawings.

60 In Figure 1A there is shown a fragmentary view, partly in section, of an anglers dispenser for crimping lead shot onto fishing line. The dispenser 1 has a plurality of circularly disposed compartments 2 each  
 65 seating and temporarily retaining a respec-

tive split lead shot 3. Each compartment 2 has an aperture 4 (Figure 1C) through which a fishing line (not shown) is inserted to be received and located within a conventional  
 70 split 5 in the lead shot 3.

The dispenser has upper and lower walls 6 and 7 defining the seating for lead shot 3. The upper wall 6 depends into the downwardly extending rear wall 8 secured by snap-fit studs 9 received in the corresponding  
 75 recess 10 in the lower wall 7 to connect the upper and lower walls 6, 7 with lead shot 3 located in each compartment 2. Compartments 2 are individually separated by downwardly depending partition walls 11 (Figure  
 80 1A) which are integral with upper wall 6. These partition walls 11 alternatively may be integral with the lower wall 6. Walls 6, 7 are shown as elevational sections taken on a dispenser of an annular configuration (as seen in plan). In another embodiment (not  
 85 shown) the walls 6, 7 are substantially circular, but other shapes may be employed.

Each compartment 2 has an outlet 12 in the lower wall 6 dimensioned such that in order to pass therethrough the lead shot 3 is crimped around the fishing line. The upper-  
 90 most edge of the lower wall 6 defining the outlet 12 also defines a seating on which the lead shot 3 rests whilst within the compartment 2.

In the upper wall 7 there are formed displaceable compartment roof portions 13 to which are applied a striking tool 14 in the direction of arrow A. An impact of the  
 100 striking tool 14 on displaceable portion 13 causes the lead shot 3 to be expressed or ejected through outlet 12. Turning to Figure 1C if the fishing line extends downwardly through slit 5 (after insertion through aper-  
 105 ture 4) and then striking tool 14 impacts displaceable portion 13, the lead shot 3 emerges below outlet 12 with the fishing line received in split 5 and the lead shot compressed around the line so as to be firmly  
 110 attached.

A modification may be described with reference to Figures 1B and 1C, the main difference being that the upper wall 7 has  
 115 spaces 15 instead of displaceable portions 13 with the result that striking tool 14 is applied directly to lead shot 3. This modification may derive from a difference in the mode of fabrication of the embodiments of Figures  
 120 1A and 1B. The two parts 6, 7 of Figure 1 are formed separately, placed in a jig containing the lead shot 3 and then connected together. The dispenser of Figure 1B is formed from plastics material moulded around the lead shot 3. One suitable manner  
 125 of holding the lead shot 3 for insertion between dispenser parts 6, 7 or prior to moulding of the dispenser of Figure 1B is shown in Figure 3A. In Figure 3A a matrix  
 130 16 of lead shot 3 is formed by cold stamping.

The circular matrix 16 has radially extending limbs 17 supporting spaced peripheral members 18, 19 between which the lead shot 3 are held by tabs 20. In the use of embodiments of dispenser of Figure 1A or Figure 1B the striking tool 14 combines the role of providing the expressing means and the means to sever lead shot 3 from tabs 20.

When seen in plan the shape of the dispenser shown in Figure 1B instead of annular (as suggested above) may be linear and the lead shot 3 may be provided in the form of a cold formed strip as shown in Figures 3B and 3C. Figure 3B being a plan and Figure 3C a section on Figure 3B. Again lead shot 3 is severed from strip waste 21 by the impact of striking tool 14.

The embodiment illustrated in Figures 2A, to 2C is similar to that of Figure 1A. In this instance the lower wall 6 is formed with outlets 12 and partition walls 11 are up-standing from the lower wall 6. A seating is provided at the top of the opening 22 defining outlet 12 by means of seating portions 23. The seating portions 23 are intended to guide the lead shot 3 downwardly into outlet 12 which, as the lead shot 3 is expressed, acts only on the width of the lead shot 3 to close its split 5. Optionally, the seating portions 23 may be extended to join one another and thereby form a single continuous seating surface portion 23 extending wholly or substantially wholly around the bounded surface of opening 22. The unbounded portion of opening 22 provides the entrance or aperture means 24 in which the fishing line (not shown) is inserted. The lead shot 3 having the fishing line receiving recess or slit 5 sits on the seating portions 23. The width of opening 22 extending between seating portions 23 is less than the diameter of the lead shot 3. The length of the opening 22 which is the dimension in Figure 2C parallel to partition walls 11, exceeds the diameter of the lead shot 3 (Figure 2B). In consequence, the force exerted to express the lead shot 3 through the outlet 12 is mainly expended in compressing the lead shot 3 to reduce its dimension across the opening 22 between the seating portions 23 (Figure 2C). This reduction in width of the lead shot 3 causes the recess or slit 5 to close around and attach the lead shot 3 to the fishing line. Such a compression or crimping action ensures attachment of the lead shot 3 to the fishing line. It will be apparent that the opening 22 may have various configurations differing from the elongated circular contour shown. A substantially circular contour is possible, but as the forces directed inwardly on the lead shot 3 normally of the seating portions 23 (Figure 2C) are the forces which perform the crimping action, the configuration shown in Figure 2C is preferred.

The upper wall 7 of Figure 2A is similar to that described with reference to Figure 1A but shown in plan. The segment shown forms the upper wall 7 of one compartment 2. A pair of recesses 25 extend along the edges of a displaceable portion 13 which has a V-shaped notch 26 further defining the aperture means 4 for receiving a fishing line (not shown) which can then extend through the recess 5 in lead shot 3, opening 22 and outlet 12 prior to the expressing of the lead shot 3. The displaceable portion 13 is integrally and hingedly connected at 27 to the main upper wall 7. If the dispenser 1 of Figures 2A to 2C is intended for repeated use by refilling the compartments 2 with lead shot 3 after emptying the dispenser, then the material forming the hinge 27 must be capable of a repeatable hinge action.

It will be noted that upper wall 7 has depending studs 9 for engagement with holes 10 by a snap-action. The form of engagement between studs 9 and holes 10 may be designed to permit the upper wall 7 and lower wall 6 to be prised apart for refilling of compartments 2, thereafter these walls 7, 6 may be reconnected for further use. A material suitable for moulding the upper wall 7 giving the hinge 27 a repeatable hinge action without cracking is polypropylene. Other pliable plastics and non-plastics materials will commend themselves for manufacture of an upper wall 7 with a hinge 27 having a repeatable action. Where a repeatable hinge action is not required as in the embodiment of Figure 1B or the embodiment of Figures 1A and 2A if these are designed to be expendable (that is not to be refilled by the angler but throw away items) other plastics materials such as polyethylene and polythene are suitable for the formation of upper and lower walls 7, 6. The configurations shown in Figures 2A and 2C are illustrative of the functional requirements of the dispenser. Manufacturing techniques, for example moulding in plastics materials or pressing from light metal sheet, may cause changes to be introduced for example, the seating portions 23 and partitions 24 may be pressed out of the plate of opening 22 which would lead to less sharp discontinuities in the contour shown in Figure 2C and perhaps even a smooth transition between opening 22, seating portions 23 and wall partitions 24.

When seen in plan, the dispenser illustrated in Figures 2A, 2B, 2C is of generally annular configuration. It may be in disc form such that the hollow centre to upper and lower walls 7, 6 is filled in. Then, the upper wall displaceable portions 13 are depressed either by a separate striking tool 14 (Figure 1A) or by the users thumb or finger. It is preferred to provide a hammer for effecting the action which causes the

lead shot to be expressed and crimped. In Figures 4 to 6 three embodiments of hammer are illustrated.

In Figure 4 the dispenser 1 is generally similar to that described in relation to Figures 1A and 2A to 2C, like parts having the same references will not be further described. In addition at the radially inward edges of the dispenser 1, the upper and lower walls 7, 6 are formed with a circumferentially extending recess 30 receiving a hammer base 31. Recess 30 has an L-shaped profile, limb 32 receiving an upstanding enlargement 33 on the hammer base 31 to retain the hammer 31 and limb 34 receiving the main portion of hammer base 31. The hammer base 31 supports an upstanding hammer pillar 35 having a hinge 36 connected to hammer striker 37. Pillar 35 extends to the top of the dispenser 1 and striker 37 overlies upper wall 7 to be located above displaceable portion 13. Manual depression of hammer striker 37 causes the lead shot 3 to be expressed. Hinge 36 is formed of a material having a repeatable hinge action. Hammer striker 37 and/or pillar 35 may be manipulated manually to circumferentially displace the striker 37 around the dispenser 1 from alignment with one compartment 2 to the next in series for successively expressing a series of lead shot 3.

In the embodiment of Figure 5 the dispenser 1 is arranged on a gun 40. Gun 40 has a trigger operated hammer mechanism 41. The dispenser 1 is similar to that of Figures 1A and A, 2C except that lower wall 6 has an arcuately shaped inner circumferential edge 42 providing a seating for trigger 43 which carries hammer 44 for striking displaceable portion 13 of upper wall 7 and thereby expressing lead shot 3. Gun 40 has central member 45 with a handle member (not shown). Trigger mechanism 41 is formed by trigger 43 pivotally mounted for displacement towards trigger stop 46 against the resilient bias of spring 47. Trigger 43 has protrusion 49 in sliding contact with seating 42 and a pivot projection 48 pivots about fixed recess 50. Dispenser 1 is manually rotatable about the rotational axis 51 of gun 40 to index compartments 2 relative to trigger 43. The hammer action of trigger hammer 44 is then employed to express lead shot 3 after fishing line (not shown) has been brought into recess 5. Dispenser 1 is retained on and rotatably displaceable about gun 40 since seating 42 on the inner circumferential edge of wall 6 engages protrusion 50 on trigger 43 and similar protrusions (not shown) integral with or attached to central member 45 of gun 40. If lower wall 6 (or at least the edge forming seating 42) is formed of a resiliently deformable material, such as polypropylene, then dis-

penser 1 may be replaceable on gun 40. Thus, the gun 40 may be designed as a re-usable item for disposable or rechargeable dispensers 1.

Turning to the embodiment of Figure 6, this only differs from that of Figure 5 in that the dispenser 1 is similar to that of Figure 1B and, in consequence, hammer striker 44 is designed with a striker projection 52 to impact directly on the lead shot 3. The other parts of the gun 40 are similar to like numbered parts in Figure 5.

It should be appreciated that a single dispenser 1 may contain shot of one or more sizes. Openings 22 and outlets 12 are related in size to the width of shot dispensed from their respective compartments 2. The guns 40 may be provided with a trigger-actuated indexing mechanism for serially displacing the compartments as lead shot is expressed. Such a mechanism is not further described herein as it is believed that relevant technology is available from the field of product labelling mechanisms.

#### WHAT I CLAIM IS:-

1. A method of crimping particulate material having a line receiving split or recess onto finer gauge line or wire, comprising inserting the finer gauge line or wire into an aperture means in a dispenser for a plurality of pre-located split particulate material elements one of which is pre-aligned with said aperture means, and expressing said one particulate material element through an outlet of said dispenser so dimensioned as to cause said split particulate material element to close around and become attached to said line.

2. A method of crimping split lead shot having a split therein onto a fishing line, comprising inserting the fishing line into an aperture means in a dispenser for dispensing a plurality of pre-spaced split lead shot, one of which is aligned with said aperture means, and expressing said one lead shot through an outlet of said dispenser so dimensioned as to cause lead shot to close around and become attached to said fishing line.

3. A dispenser for crimping particulate material having a line or wire receiving split or recess onto finer gauge line or wire comprising a body having at least one compartment defining a seating for a single element of particulate material of a size related to said seating, the compartment having an entrance for said line or wire to be brought therein and received in the split or recess of said element whilst the element is retained on the seating and above an outlet and within said compartment, said outlet being dimensioned to exert a crimping action on a particulate element expressed therethrough.

4. A dispenser as claimed in Claim 3, 130

wherein the particulate material element is split lead shot contained within the compartment.

5 5. A dispenser as claimed in Claim 4, wherein the outlet in the or each compartment and its associated seating is intended for one size of split lead shot, and the dispenser is adapted to be re-chargeable with shot.

10 6. A dispenser as claimed in any one of Claims 3 to 5, wherein the means for expressing the particulate material element is a separate tool.

15 7. A dispenser as claimed in any one of Claims 3 to 6, wherein the compartment is adapted to express elements by the provision of a displaceable wall portion.

20 8. A dispenser as claimed in any one of Claims 3 to 8, comprising means for expressing the particulate material element through said outlet.

25 9. A dispenser as claimed in Claim 8, wherein said expressing means comprises a hammer member incorporated in the dispenser to directly express the elements.

30 10. A dispenser as claimed in Claim 8, wherein said expressing means comprises a hammer element to displace a displaceable wall portion of the compartment which, in turn, directly expresses the element.

35 11. A dispenser as claimed in one of Claims 4 or 5, wherein the lead shot is individually encapsulated in respective ones of a series of compartments.

40 12. A dispenser as claimed in any one of Claims 3 to 7, wherein the dispenser comprises a plurality of compartments arranged in series.

45 13. A dispenser as claimed in Claim 12, wherein the dispenser comprises upper and lower walls spanned by partition walls defining said compartments.

50 14. A dispenser as claimed in Claim 13, wherein the upper and lower walls as seen in plan are annular.

55 15. A dispenser as claimed in Claim 13, wherein the upper and lower walls as seen in plan are circular plates.

60 16. A dispenser as claimed in Claim 13, wherein the upper and lower walls as seen in plan are linear.

65 17. A dispenser as claimed in any one of Claims 13 to 16, wherein the upper and lower walls are formed separately and then connected together with lead shot of appropriate size located within each compartment.

18. A dispenser as claimed in any one of Claims 13 to 16, wherein the upper and lower walls are moulded around the lead shot.

19. A dispenser as claimed in either Claim 17 or Claim 18, wherein the lead shot is cast individually.

20. A dispenser as claimed in either

Claim 17 or Claim 18, wherein the lead shot is formed in a matrix.

21. A dispenser as claimed in any one of the preceding claims 3 to 6 and 12 to 20, wherein the compartment has an upper wall displaceable portion hingedly connected to said upper wall for the purpose of depressing the displaceable portion to express a said particulate material element.

22. A dispenser as claimed in Claim 21, wherein the hinge is capable of repeatable hinge actions.

23. A dispenser as claimed in Claim 22, wherein the upper wall is formed with an integral displaceable portion and the hinge is contained therein.

24. A dispenser as claimed in any one of Claims 12 to 23, comprising a hammer arranged in a recess in the dispenser to be slidably displaceable along the dispenser from one to the next in the series of said compartments.

25. A dispenser as claimed in any one of Claims 12, to 23, wherein the dispenser is adapted to be received on a gun having a trigger mechanism for expressing the particulate material elements.

26. A dispenser as claimed in one of Claims 4 or 5, wherein the dispenser is adapted for lead shot to be fed successively into a single dispensing compartment.

27. A dispenser as claimed in Claim 7, wherein the dispenser is adapted to receive lead shot in strip form and wherein in operation of the dispenser an individual lead shot weight is severed from the strip as it is expressed the strip then being advanced to bring a succeeding item of lead shot into the dispensing compartment.

28. In combination a dispenser as claimed in Claim 25 and a gun having a trigger mechanism for expressing the particulate material elements.

29. A combination as claimed in Claim 28, wherein the dispenser is annular and an inner circumferential edge thereof is adapted as a seating for a protrusion on the trigger mechanism, relative rotation of the dispenser and gun occurring on passage of the protrusion along the seating.

30. A combination as claimed in Claim 29, wherein the trigger mechanism comprises a trigger pivotally arranged on the gun and alignable with successive compartments by said relative rotation.

31. A combination as claimed in Claim 30, wherein each triggering action of the trigger actuates an indexing mechanism to bring the next dispenser compartment into alignment with the trigger.

32. A method of crimping particulate material having a line receiving split or recess onto finer gauge line or wire, substantially as hereinbefore described with reference to the accompanying drawings.

33. A dispenser for crimping particulate material onto finer gauge line or wire, arranged, constructed and adapted to operate as hereinbefore described with reference to Figures 1A and 1C, or Figure 1B and 1C, or Figures 2A to 2C, or any one of these as modified by the incorporation of a hammer as shown in one of Figures 4 to 6 or as modified for use with a hammer in a gun as described in relation to Figures 5 or 6 or any one of these employing lead shot in a matrix as described with reference to Figure 3A or Figures 3B and 3C.

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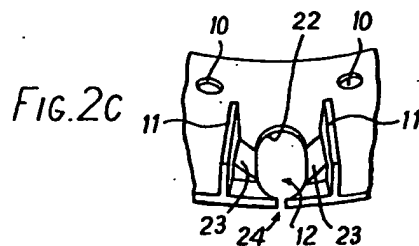
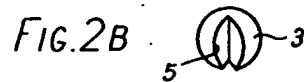
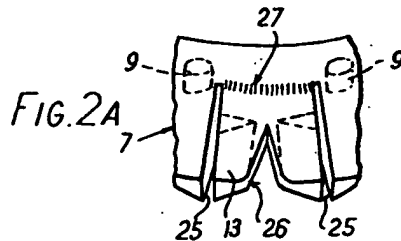
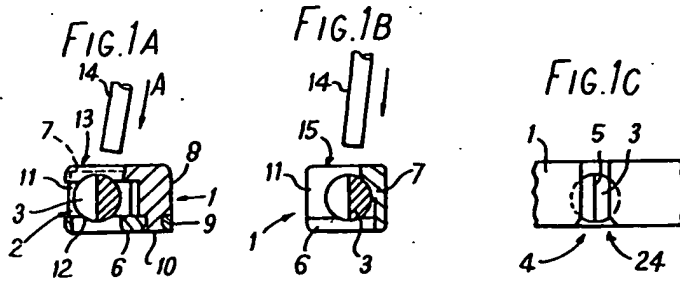
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